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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
DAVIS, PATRICIA A	
ART UNIT	PAPER NUMBER
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/582,491	SU ET AL.	
	Examiner	Art Unit	
	PATRICIA DAVIS	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 September 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) *5 and 6* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/21/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 1-4, in the reply filed on September 11, 2009 is acknowledged. Claims 5 and 6 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

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Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Matsubayashi et al. (JP 11-265725) (hereinafter "Matsubayashi").

Regarding claim 1, Matsubayashi teaches a method for operating a fuel cell system with electric power supply from a fuel cell to the external load, which includes a reforming section (31), a burner (combustion section 32), a CO stripper (carbon monoxide reduction section 5) to reduce the carbon monoxide content in the reformate and a fuel cell (6) that takes in the reformed gas from the CO stripper (see pars. 0016, 0019 and 0023). Matsubayashi further teaches that in order to start the reforming reaction of a fuel gas the temperature of the reformer (31) is important so the fuel gas is circulated through the piping (102) and first sent directly to the burner (first preheating

process) (see pars. 0019 and 0020). Matsubayashi further teaches once the reformer is heated up a valve is operated to introduce only the fuel gas into the desulfurization treatment which is then ejected from ejector (2) into the reformer (31), where a reforming reaction occurs to make the reformate. The reformate is then sent to the CO transformer (4) and then to the CO stripper (carbon monoxide reduction section 5) (see pars. 0019-0022; fig. 1). Matsubayshi further teaches that after the reformate is sent to the CO stripper (5) the reduced gas is sent to the fuel cell (6) to form an electric power supply which is sent to an external load (see par. 0024).

Regarding claim 2, Matsubayshi teaches that when the operating temperature limit is reached in the reformer (31), the CO transformer (4) and the CO stripper (carbon monoxide reduction section 51) then a three way valve (107) is swited to the fuel cell side and the opeartion is started for the electrochemical reaction to produce power (see pars. 0022-0024).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsubayashi as applied to claims 1 and 2 above, further in view of Sawada et al. (JP 2002-289226) (hereinafter "Sawada").

Regarding claim 3, Matsubayashi teaches a method for operating a fuel cell system with electric power supply from a fuel cell to the external load, which includes piping (100) that supplies fuel gas (raw material fuel), a reforming section (31), a burner (combustion section 32), a CO stripper (carbon monoxide reduction section 5) to reduce the carbon monoxide content in the reformate and a fuel cell (6) that takes in the reformed gas from the CO stripper. Matsubayashi further teaches that the unreacted exhaust is sent back to the burner (combustor 32) to heat the burner by way of piping (109) (see pars. 0016, 0017, 0019 and 0023).

Matsubayashi does not specifically teach a reforming section temperature comparing process including steps of detecting temperature in the reforming section and comparing the detected temperature in the reforming section and comparing the detected temperature with predetermined first and second temperatures; a current decreasing process for decreasing an output current from the fuel cell when the detected temperature is equal to or lower than the first temperature in the reforming section temperature comparing process and maintaining the output current for a predetermined time period after the output current has been decreased; and a current

increasing process of increasing the output current from the fuel cell when the detected temperature is equal to or higher than the second temperature in the reforming section temperature comparing process and maintaining the output current for a predetermined time period after the output current has been increased.

However, Sawada teaches a reformer temperature control system of a fuel cell power plant, when the temperature of a reformer is higher than the target temperature (second temperature), a direct current value is made to increase by a direct current value control means, the quantity of the reformed gas consumed with a fuel cell body can be made to increase. However, when the temperature of a reformer is lower than the target temperature (first temperature), a direct current value is decreased by a direct current value control means (see par. 0011). Sawada further teaches that the reformer temperature control system of the fuel cell power plant is able to increase or decrease a direct current value by the direct current value control means in any way when the temperature of the reformer is higher or lower than the target temperature, thereby controlling the temperature and performance of the reformer (see par. 0025). Therefore, it would have been obvious to one with ordinary skill in the art to combine the reformer temperature control system into the fuel cell system of Matsubayashi, because Sawada teaches it is used to control the desired output performance of the reformer.

Regarding claim 4, Matsubayashi teaches a piping (100) that supplies fuel gas (raw material fuel).

Matsubayashi does not specifically teach does a fuel increasing process of increasing the supply amount of the raw material fuel from the raw material fuel supply

section when a number of consecutive times the current decreasing process has been carried out reaches a predetermined value; and a fuel decreasing process of decreasing the supply amount of the raw material fuel from the raw material fuel supply section when a number of consecutive times the current increasing process has been carried out reaches a predetermined value.

However, Sawada teaches a reformer temperature control system of a fuel cell power plant, when the temperature of a reformer is higher than the target temperature (second temperature), a direct current value (predetermined value) is made to increase by a direct current value control means, the quantity of the reformed gas consumed with a fuel cell body can be made to increase. However, when the temperature of a reformer is lower than the target temperature (first temperature), a direct current value (predetermined value) is decreased by a direct current value control means (see par. 0011). Sawada further teaches that the reformer temperature control system of the fuel cell power plant is able to increase or decrease a direct current value by the direct current value control means in any way when the temperature of the reformer is higher or lower than the target temperature, thereby controlling the temperature and performance of the reformer (see par. 0025). Sawada further teaches a temperature sensor (10) which measures the temperature of the reformer (1), the temperature sensor (10) is connected to a controller (11), where the target temperature setting means (12) and the ac output desired value setting-out means (13) are connected to the controller (11), and the direct-current controller (14) of the inverter (3) and the flow control valve (15) as a flow control means are provided in the raw-materials-and-

mineral-fuel feed pipe (4). Sawada further teaches that the controller (11) is equipped with the direct-current value control means (16), the raw-materials-and-mineral-fuel amount-of-supply setting-out means (17), and the raw materials-and-mineral-fuel amount-of supply control means (18) (see pars. 0016 and 0017; drawing 2).

Therefore, it would be obvious to one with ordinary skill in the art to incorporate a controller capable of increasing or decreasing the amount of fuel supplied to the fuel cell after a consecutive amount of measurements to the fuel cell system and fuel cell supplier of Matsubayashi, because Sawada teaches a the controller that is capable of doing this to send the correct amount of the fuel cell supply to the system for the desired performance.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICIA DAVIS whose telephone number is (571)270-7868. The examiner can normally be reached on 7:30am-5pm EST. Monday-Friday, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICIA DAVIS/
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795